

Claims

[c1] I claim:

1. A brake booster having a housing wherein an interior that is separated into a front chamber and a rear chamber by a wall arrangement, said wall arrangement having a hub with an first axial bore therein for retaining a control valve that controls communication of a first fluid between the front chamber and rear chamber in a first mode of operation and controls communication of a second fluid between said rear chamber and the surrounding environment in a second mode of operation to create a pressure differential across said wall arrangement and develop an output force that is communicated through an output member to effect a brake application, said control valve being selectively actuated from said first mode of operation to said second mode of operation in response to a first input force applied to a brake pedal and in response to a second input force developed by an electromagnetic member under the control of an electronic control unit, said output member encountering resistance during a brake application that is communicated through a reaction arrangement as a reaction force to balance said first and second input forces, said reaction

arrangement being characterized by a disc member located between said hub and said output member that receives said reaction force, a first shaft connected to said disc member for communicating said reaction force to balance said first input force supplied by said first input member and a second shaft connected to said disc member for communicating said reaction force to balance said second input force supplied by said electromagnetic member such that a resulting output force is matched with a desired brake application.

[c2] 2. The brake booster as recited in claim 1 wherein said reaction arrangement is further characterized by said second shaft having an effective diameter that is smaller than an effective diameter of said first shaft and as a result a reaction force necessary to balance said second input force is proportionally smaller than a reaction force necessary to balance said first input force.

[c3] 4. The brake booster as recited in claim 3 wherein said electromagnetic member is characterized by a second plunger having a second cylindrical member that surrounds said first shaft with a groove that receives said lip on said first cylindrical, said lip moving in said groove to allow said first cylindrical member to independently move with respect to said second cylindrical member.

- [c4] 5. The brake booster as recited in claim 4 wherein said control valve is further characterized in that engagement of said first shaft with plunger does not occur until said reaction force moves said first shaft close a gap between said first shaft and said plunger to define a solid link with said input member and thereafter balance said input force applied to the brake pedal during a brake application.
- [c5] 6. The brake booster as recited in claim 5 wherein said reaction arrangement is further characterized in that said second shaft is located between said disc and said second cylindrical member and during a brake application in response to said first input force said reaction force acts on said second shaft to urge said second cylindrical member toward said first cylindrical member.
- [c6] 7. The brake booster as recited in claim 6 wherein said reaction arrangement is further characterized in that said second input force initially moves said second shaft from a rest position into said disc and said reaction force returns said second cylindrical member to said rest position to balance said second input force during a brake application.
- [c7] 8. The brake booster as recited in claim 7 wherein said second shaft is characterized by first and second pins

through which said reaction force is communicated to said second cylindrical member.

- [c8] 9. The brake booster as recited in claim 8 wherein said reaction arrangement is further characterized by sensor means having a first component fixed to said hub and a second component connected to said first cylindrical to provide said electronic control unit with a signal indicating a desire to shift control of said control valve from said electromagnetic member to said first input member.
- [c9] 10. The brake booster as recited in claim 9 wherein reaction arrangement is characterized in that said first input force and said second input force are exclusive and not cumulative.
- [c10] 11. The brake booster as recited in claim 10 wherein an output force generated in response to said first input force and an output force generated in response to said second input force are similar.